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Consulting & Technologies

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December 18, 1995

Mr. Jesse Brungardt
Senior Environmental Analyst
Public Service Company of Colorado
Fort St. Vrain Plant
16805 Weld County Road 19.5
Platteville, CO 80561

Re: Executive Summary for Water Quality Assessment at Lake Thomas Site.

Dear Mr. Brungardt:

The purpose of this correspondence is to provide an Executive Summary of the findings of a water quality assessment conducted at Public Service Company's Lake Thomas facility in Weld County, Colorado during the week of September 5, 1995. The objective of this evaluation was to determine the cause of, and possible solutions to, an odor problem which appears at the site occasionally during the warm summer months.

During the initial site investigation, numerous water and sludge samples were collected from various points within the lake. Water samples were also obtained from several locations within the watershed leading to the lake. Samples were submitted to reputable laboratories for analysis of all chemical and microbiological parameters which might be

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directly or indirectly related to the problem. Air sampling was also done to help pinpoint exact locations of odor emissions and estimate potential downwind concentrations of hydrogen sulfide gas.

Results of the site assessment showed that Lake Thomas is currently a very "healthy" ecosystem which is only peripherally related to the odor problem. The lake is only related to the odor problem in that it contains a significant accumulation of sludge with high concentrations of sulfides and other odorous "reduced" sulfur compounds. This sludge was likely formed by past site activities unrelated to Public Service Company, such as the inflow of large amounts of municipal and agricultural wastes. The vast majority of this sludge is harmlessly "fixed" in place at the bottom of the lake. As such, no odors are being released from the lake itself at the present time.

The intermittent odor problem appearing at the lake site can be traced exclusively to the outfall "impact structure" through which water passes upon its release from the lake. The existing discharge configuration collects water from an "intake structure" which lies in a trench at the bottom of the lake. It appears from all observations that odor releases are solely the result of sludge amassed around this structure becoming entrained with the water destined for discharge. When the sludge-bearing water passes into the impact structure and is exposed to very warm air, odorous compounds, including hydrogen sulfide gas, evolve from the water into the atmosphere. These odors are then subsequently transported downwind in accordance with prevailing wind currents.


Air monitoring conducted during the water quality assessment project confirmed that the only odor emission source on the Lake Thomas property is the outfall impact structure. It also indicated that, on the days when air sampling was performed, downwind concentrations of hydrogen sulfide gas were well below levels of health concern at the property boundaries.

*Taken in
Fall after
Temperature
had dropped*

Because of its localized nature, the Lake Thomas odor problem can be easily solved by application of either of two cost-effective remedies. The preferable option, due to its permanence, would be to modify the discharge intake structure such that water is collected from a point which is five to ten feet off the lake bottom, above the fixed sludge layer. The second alternative would be to enclose the impact structure and control the odor emissions with a dilute spray of chemical oxidant.

Should you have any questions concerning this summary or need additional information, please feel free to contact me at (303) 650-5231.

Sincerely,



Darrell L. Dechant, Ph.D., CIH
Encore Environmental, Inc.